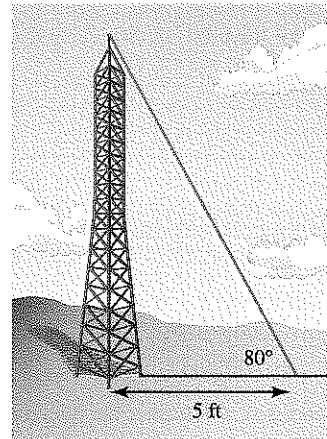
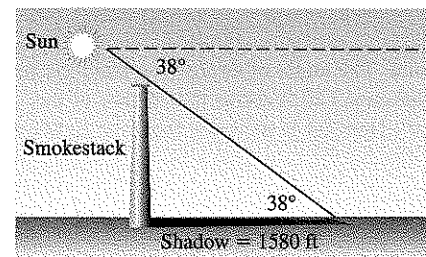


- 4. Finding a Baseball Stadium Dimension** The top row of the red seats behind home plate at Cincinnati's Riverfront Stadium is 90 ft above the level of the playing field. The angle of depression to the base of the left field wall is 14° . How far is the base of the left field wall from a point on level ground directly below the top row?

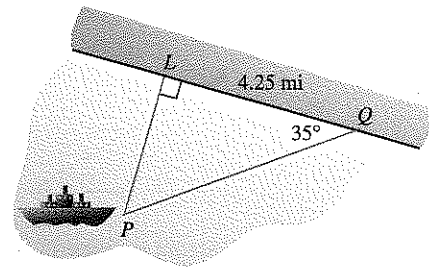
- 5. Finding a Guy-Wire Length** A guy wire connects the top of an antenna to a point on level ground 5 ft from the base of the antenna. The angle of elevation formed by this wire is 80° . What are the length of the wire and the height of the antenna?



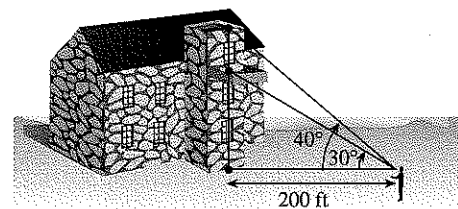
- 6. Finding a Length** A wire stretches from the top of a vertical pole to a point on level ground 16 ft from the base of the pole. If the wire makes an angle of 62° with the ground, find the height of the pole and the length of the wire.
- 7. Height of Eiffel Tower** The angle of elevation of the top of the TV antenna mounted on top of the Eiffel Tower in Paris is measured to be $80^\circ 1' 12''$ at a point 185 ft from the base of the tower. How tall is the tower plus TV antenna?
- 8. Finding the Height of Tallest Chimney** The world's tallest smokestack at the International Nickel Co., Sudbury, Ontario, casts a shadow that is approximately 1580 ft long when the sun's angle of elevation (measured from the horizon) is 38° . How tall is the smokestack?



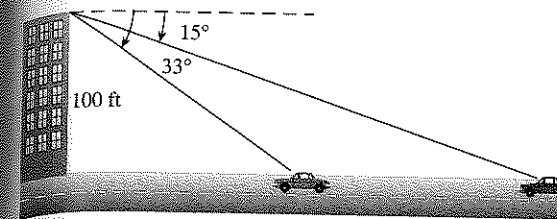
- 9. Cloud Height** To measure the height of a cloud, you place a bright searchlight directly below the cloud and shine the beam straight up. From a point 100 ft away from the searchlight, you measure the angle of elevation of the cloud to be $83^\circ 12'$. How high is the cloud?
- 10. Ramping Up** A ramp leading to a freeway overpass is 470 ft long and rises 32 ft. What is the average angle of inclination of the ramp to the nearest tenth of a degree?
- 11. Antenna Height** A guy wire attached to the top of the KSAM radio antenna is anchored at a point on the ground 10 m from the antenna's base. If the wire makes an angle of 55° with level ground, how high is the KSAM antenna?
- 12. Building Height** To determine the height of the Louisiana-Pacific (LP) Tower, the tallest building in Conroe, Texas, a surveyor stands at a point on the ground, level with the base of the LP building. He measures the point to be 125 ft from the building's base and the angle of elevation to the top of the building to be $29^\circ 48'$. Find the height of the building.
- 13. Navigation** The *Paz Verde*, a whalewatch boat, is located at point P , and L is the nearest point on the Baja California shore. Point Q is located 4.25 mi down the shoreline from L and $\angle PLQ = 90^\circ$. Determine the distance that the *Paz Verde* is from the shore if $\angle PQL = 35^\circ$.



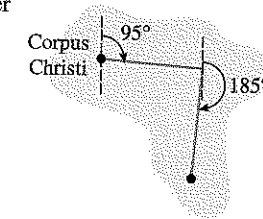
- 14. Recreational Hiking** While hiking on a level path toward Colorado's front range, Otis Evans determines that the angle of elevation to the top of Long's Peak is 30° . Moving 1000 ft closer to the mountain, Otis determines the angle of elevation to be 35° . How much higher is the top of Long's Peak than Otis's elevation?
- 15. Civil Engineering** The angle of elevation from an observer to the bottom edge of the Delaware River drawbridge observation deck located 200 ft from the observer is 30° . The angle of elevation from the observer to the top of the observation deck is 40° . What is the height of the observation deck?



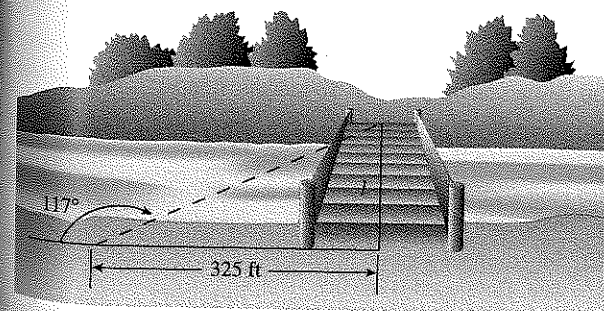
- 16. Traveling Car** From the top of a 100-ft building a man observes a car moving toward him. If the angle of depression of the car changes from 15° to 33° during the period of observation, how far does the car travel?



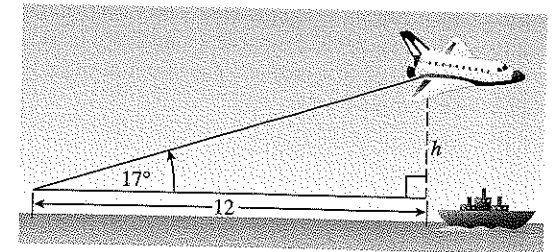
- 17. Navigation** The Coast Guard cutter *Angelica* travels at 30 knots from its home port of Corpus Christi on a course of 95° for 2 hr and then changes to a course of 185° for 2 hr. Find the distance and the bearing from the Corpus Christi port to the boat.



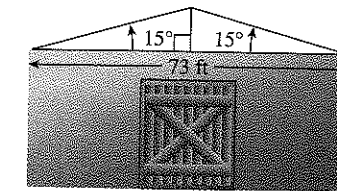
- 18. Navigation** The *Cerrito Lindo* travels at a speed of 40 knots from Fort Lauderdale on a course of 65° for 2 hr and then changes to a course of 155° for 4 hr. Determine the distance and the bearing from Fort Lauderdale to the boat.
- 19. Land Measure** The angle of depression is 19° from a point 7256 ft above sea level on the north rim of the Grand Canyon level to a point 6159 ft above sea level on the south rim. How wide is the canyon at that point?
- 20. Ranger Fire Watch** A ranger spots a fire from a 73-ft tower in Yellowstone National Park. She measures the angle of depression to be $1^\circ 20'$. How far is the fire from the tower?
- 21. Civil Engineering** The bearing of the line of sight to the east end of the Royal Gorge footbridge from a point 325 ft due north of the west end of the footbridge across the Royal Gorge is 117° . What is the length l of the bridge?



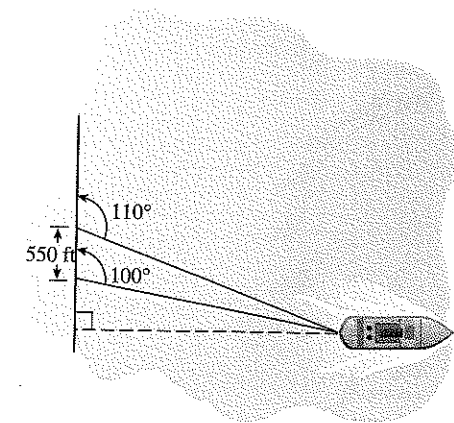
- 22. Space Flight** The angle of elevation of a space shuttle from Cape Canaveral is 17° when the shuttle is directly over a ship 12 mi downrange. What is the altitude of the shuttle when it is directly over the ship?



- 23. Architectural Design** A barn roof is constructed as shown in the figure. What is the height of the vertical center span?



- 24. Recreational Flying** A hot-air balloon over Park City, Utah, is 760 ft above the ground. The angle of depression from the balloon to an observer is 5.25° . Assuming the ground is relatively flat, how far is the observer from a point on the ground directly under the balloon?
- 25. Navigation** A shoreline runs north-south, and a boat is due east of the shoreline. The bearings of the boat from two points on the shore are 110° and 100° . Assume the two points are 550 ft apart. How far is the boat from the shore?



- 26. Navigation** Milwaukee, Wisconsin, is directly west of Grand Haven, Michigan, on opposite sides of Lake Michigan. On a foggy night, a law enforcement boat leaves from Milwaukee on a course of 105° at the same time that a small smuggling craft steers a course of 195° from Grand Haven. The law enforcement boat averages 23 knots and collides with the smuggling craft. What was the smuggling boat's average speed?